



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/805,841	03/14/2001	Toshiki Inoue	TALW-0180	3801

7590

11/05/2003

Michael P. Dunnam, Esq.
WOODCOCK WASHBURN KURTZ MACKIEWICZ & NORRIS
One Liberty Place - 46th Floor
Philadelphia, PA 19103

EXAMINER

NICOLAS, WESLEY A

ART UNIT	PAPER NUMBER
----------	--------------

1742

DATE MAILED: 11/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/805,841

Applicant(s)

INOUE ET AL.

Examiner

Wesley A. Nicolas

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-6 is/are allowed.
- 6) ☒ Claim(s) 7-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 10.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

This is in response to the RCE submitted October 6, 2003. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-11 are currently pending in this application.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 6, 2003 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

Art Unit: 1742

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahms et al. (6,099,711), and further in view of Schumacher et al. (5,976,341).

The rejection of claims 1-11 using Dahms et al. and Schumacher et al. as set forth in a previous Office action (Final Rejection dated May 5, 2003) has been **withdrawn** in view of the arguments and amendment made by application in the RCE submitted October 6, 2003.

5. Claims 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahms et al., and further in view of Reynolds (5,683,564) and Hauptmann et al. (6,537,439).

Dahms et al. teach an electrolytic plating device comprising:

- an insoluble electrode (col. 6), which is an electrode as opposed to a wiring board (col. 4, lines 46-52 and col. 6, lines 6-15);
- a metal plating solution containing iron ions of at least 0.1 g/l (cols. 7 and 8);
- applying a forward/reverse current between the wiring board and said insoluble electrode (Fig. 1, and Example 4); and
- plating of microvia holes with said metal plating (col. 4, lines 46-49; col. 6, lines 6-13; and Example 4).

Dahms et al. fail to specifically teach of a specific power source but do teach that a pulse reverse current is applied to the workpiece. Dahms et al. also fail to specifically

Art Unit: 1742

teach a stirring unit stirring said metal plating solution to make the solution flow in parallel to a surface to be plated of said wiring board but does however teach of circulating said fluid (col. 10, lines 6-13).

Reynolds teaches a stirring unit for stirring said metal plating solution (Figs. 2 and 3, numeral 72).

Hauptmann et al. teaches flowing solution in parallel to a surface to be electrolytically treated (Abstract and col. 6).

Claims 7 and 9 are rejected because it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified Dahms et al. to use the stirring unit of Reynolds to flow the solution in parallel to the substrate as taught by Hauptmann et al. because Reynolds teaches that agitation of the electrolytic fluid helps drawn the electrolyte past the substrate (Abstract), and Hauptmann et al. teach that parallel flow of electrolyte past the substrate aids chemical reaction within the boundary layer (Abstract) which would have increased the overall deposition rate and efficiency of the apparatus. Reynolds et al. further teach that the stirring unit can be adjusted in speed which would have allowed the user to fine tune the agitation of the electrolyte fluid (Abstract: "speed between about 35 and 80 RPM").

Regarding Applicant's claimed "power source for performing electrolytic plating...", although Dahms et al. discloses an identical current but not the specific power source, the power source is inherently present in the prior art because in order to have a current as disclosed by Dahms et al., you need a power source. Furthermore, regarding the specific claim language of the specific solution composition and substrate

Art Unit: 1742

features, claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 120 USPQ 528, 531 (CCPA 1959) . "Apparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) . Here, Examiner is not reading said limitation as a means-plus-function limitation and therefore said limitation is merely an intended use which is given little patentable weight. If applicant would like to give the claim structural language, he should change "by applying" to "which is adapted to apply." Furthermore, regarding the "microvia holes having copper foil at the bottom," Applicant cannot distinguish the claim from the prior art by claiming different substrate properties because it is the structure of the apparatus which determines patentability, not the features of the substrate to be treated in the apparatus.

Claim 8 is rejected because Dahms et al. teach that microvia holes formed on a printed-circuit board are filled up with pulse reverse electrolytic plating (Example 7). As set forth in the claim objections above, this claim is objected to for failure to further limit the claim because it does not further define the structure of the apparatus, but merely a result of performing a process.

Claim 10 is rejected because Dahms et al. teach of a plating bath accommodating the insoluble electrode and the wiring board (col. 9, lines 58-62), and a copper dissolved bath supplying copper ions to said plating bath (col. 8, lines 5-14); wherein said stirring unit circulates the solution with the copper dissolved bath and the plating solution within the plating bath (col. 11, lines 19-24).

Art Unit: 1742

Claim 11 is rejected because Dahms et al. teach that the insoluble electrode is implemented by a multi-aperture electrode (col. 6, lines 66-67); and the metal plating solution is implemented by a copper plating solution (col. 8, lines 5-14).

REMARKS - Response to Arguments

6. Applicant's arguments filed October 6, 2003 have been fully considered but they are not persuasive.

Examiner has withdrawn the prior art rejections with respect to the Dahms et al. - Schumacher et al. combination, but has applied new rejections to apparatus claims 7-11 for the reasons set forth above.

Applicant's amendment in combination with the arguments submitted October 6, 2003 with respect to method claims 1-6 are convincing. With respect to Applicant's arguments of claims 7-11, Examiner has set forth a new rejection which applies to the amended claim 7. Applicant is reminded that he should not attempt to distinguish the instant invention over the prior art of record using features of the substrate to be treated (*i.e.* workpiece), but instead should concentrate on the features of the apparatus.

Allowable Subject Matter

7. Claims 1-6 are allowed over the prior art of record.

8. The following is a statement of reasons for the indication of allowable subject matter:

Art Unit: 1742

The specific electrolytic plating method which deposits metal plating on a wiring board having copper foil at the bottom of each microvia hole which acts as one pole, and an insoluble electrode at the other pole, while stirring the metal plating solution having an iron ion concentration of at least 0.1 g/L so as to make the solution flow in parallel to the surface to be plated while applying forward/reverse current was not taught or suggested by the prior art of record.

Art Unit: 1742

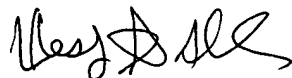
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley Nicolas whose telephone number is (703)305-0082. The examiner can normally be reached on Mon.-Thurs. from 7am to 5pm.

The Supervisory Primary Examiner for this Art Unit is Roy King whose telephone number is (703) 308-1146.

The fax number for this Group is (703) 872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.



WESLEY A. NICOLAS
PATENT EXAMINER

November 2, 2003